

# Real-World Treatment Patterns for Acute Lymphoblastic Leukemia Utilizing US Claims Data

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## BACKGROUND

- Treatment options for acute lymphoblastic leukemia (ALL) have rapidly evolved over recent years to include immunotherapies such as bispecific T-cell engager (BiTE) and chimeric-antigen receptor T-cell (CAR-T) therapies.<sup>1</sup>
- Blinatumomab (BiTE therapy; FDA approved in December 2014) and tisagenlecleucel (CAR-T; FDA approved in August 2017) are two examples of therapies that have been approved for use in relapsed/refractory b-cell ALL (B-ALL) over the past few years.<sup>1</sup>

## OBJECTIVE

- To assess demographic characteristics and real-world treatment patterns of ALL patients using the Komodo Healthcare Map™ (Komodo), a longitudinal United States (US) claims database.

## METHODS

- ALL patients with at least one diagnosis code (ICD-10: C910x; ICD-9: 2040, 20400, 20401, 20402) between 01 September 2017 through 31 December 2022 were identified.
- Unique patients with a procedure (HCPCS, ICD-10-PCS codes) and/or drug (NDC codes) used to treat ALL were reviewed.
- Patients were followed up until end of the study period (31 December 2022).
- Demographics and treatment patterns of select medications were assessed for the patient cohort.

Table 1. Definitions

Term	Definition
Index date	First recorded date of ALL diagnosis
First LoT	Date of earliest prescription or administration for ALL treatment on or after the index date
Subsequent LoTs start date	Date of the earliest treatment on or after the end of the prior LoT (60 days after)

ALL: Acute lymphoblastic leukemia; LoT: Line of therapy

Figure 1. ALL Patient Flow Chart

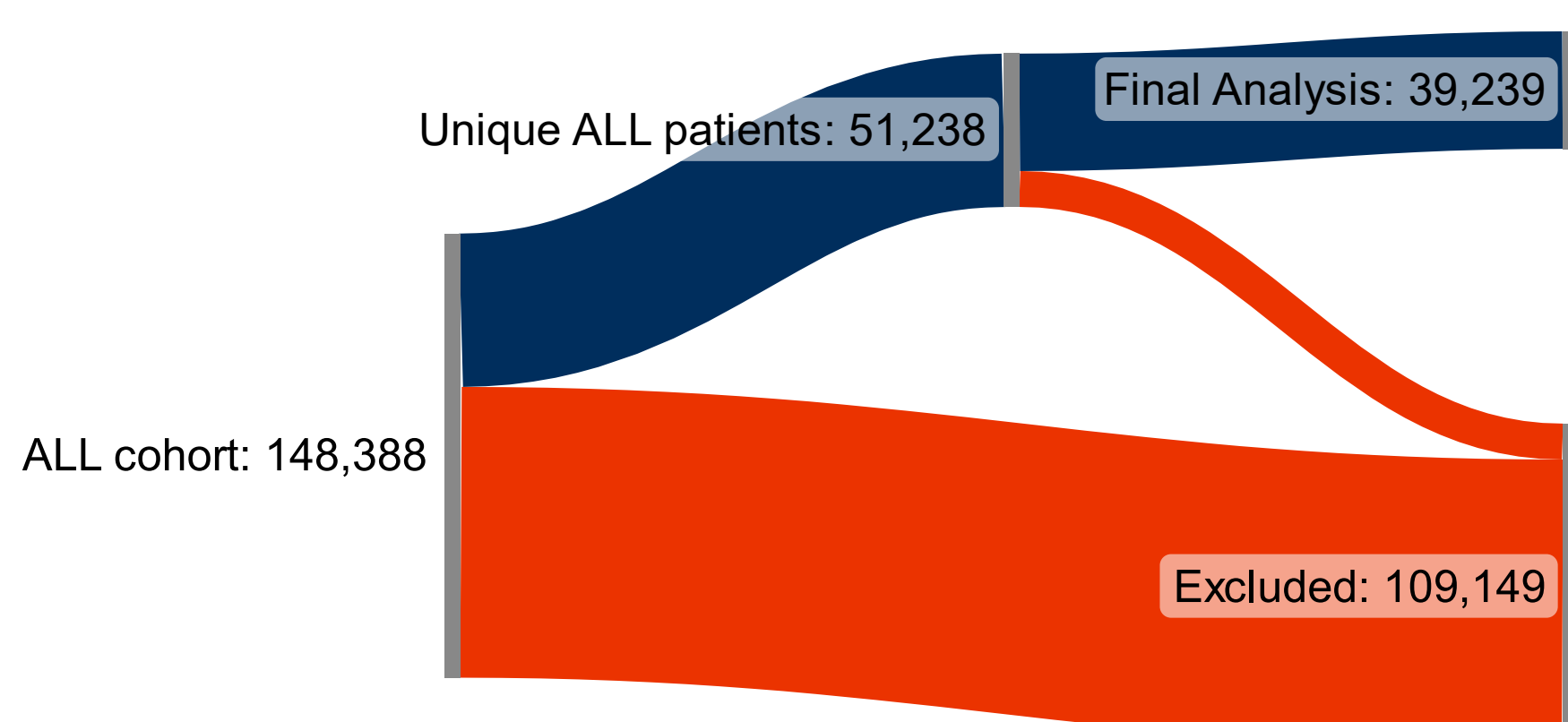
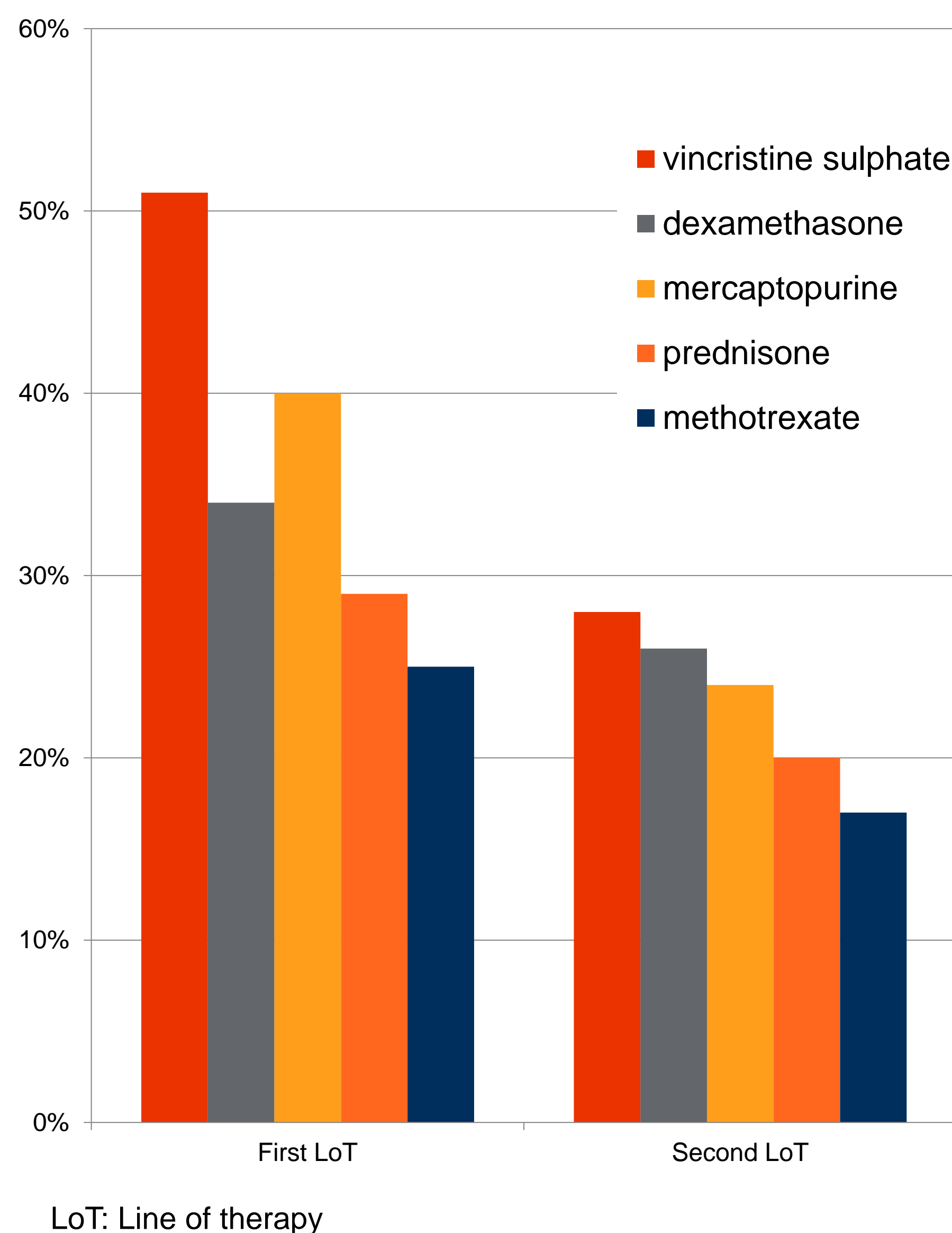


Figure 2. Common therapies used for First and Second LoT for ALL Patients



## RESULTS

### Patient Characteristics

- Using only ICD diagnosis codes, 148,388 patients with ALL were identified (Figure 1).
- Of the 148,388 patients, 51,238 unique patients were identified with an NDC drug or procedure code related to ALL treatment (Figure 1).
- 77% (n=39,239/51,238) of ALL patients had at least one inpatient ALL claim or two outpatient ALL claims and were included in the analysis (Figure 1).
- Majority of the patients were male (58%).
- About half of ALL patients (n=20,029; 51%) were 18 years or older.
- Median length of follow-up was 29 months (Interquartile range [IQR]: 38 months) (Table 2).
- Median number of lines of therapy (LoT) identified was 2 (IQR: 2) (Table 2).

### Treatment Patterns

- Common therapeutic agents used for the first LoT included (Figure 2):
  - Vincristine sulphate (n=20,236; 51%)
  - Mercaptopurine (n=15,638; 40%)
  - Dexamethasone (n=13,385; 34%)
  - Prednisone (n=11,343; 29%)
  - Methotrexate (n=9,812; 25%)
- Common therapeutic agents used for the second LoT included (Figure 2):
  - Vincristine sulphate (n=10,963; 28%)
  - Dexamethasone (n=10,435; 26%)
  - Mercaptopurine (n=9,243; 24%)
  - Prednisone (n=7,691; 20%)
  - Methotrexate (n=6,683; 17%)

### Treatment Patterns

- Common therapeutic agents used for the third LoT (and higher LoT) included:
  - Vincristine sulphate (n=11,703; 30%)
  - Mercaptopurine (n=10,256; 26%)
  - Dexamethasone (n=8,960; 23%)
  - Prednisone (n=8,845; 23%)
  - Methotrexate (n=8,699; 22%)
- Blinatumomab and tisagenlecleucel were administered among a few patients as the second LoT or higher (Figure 3).

Figure 3. Percentage of patients administered blinatumomab and tisagenlecleucel as Second LoT and Third LoT (and higher)

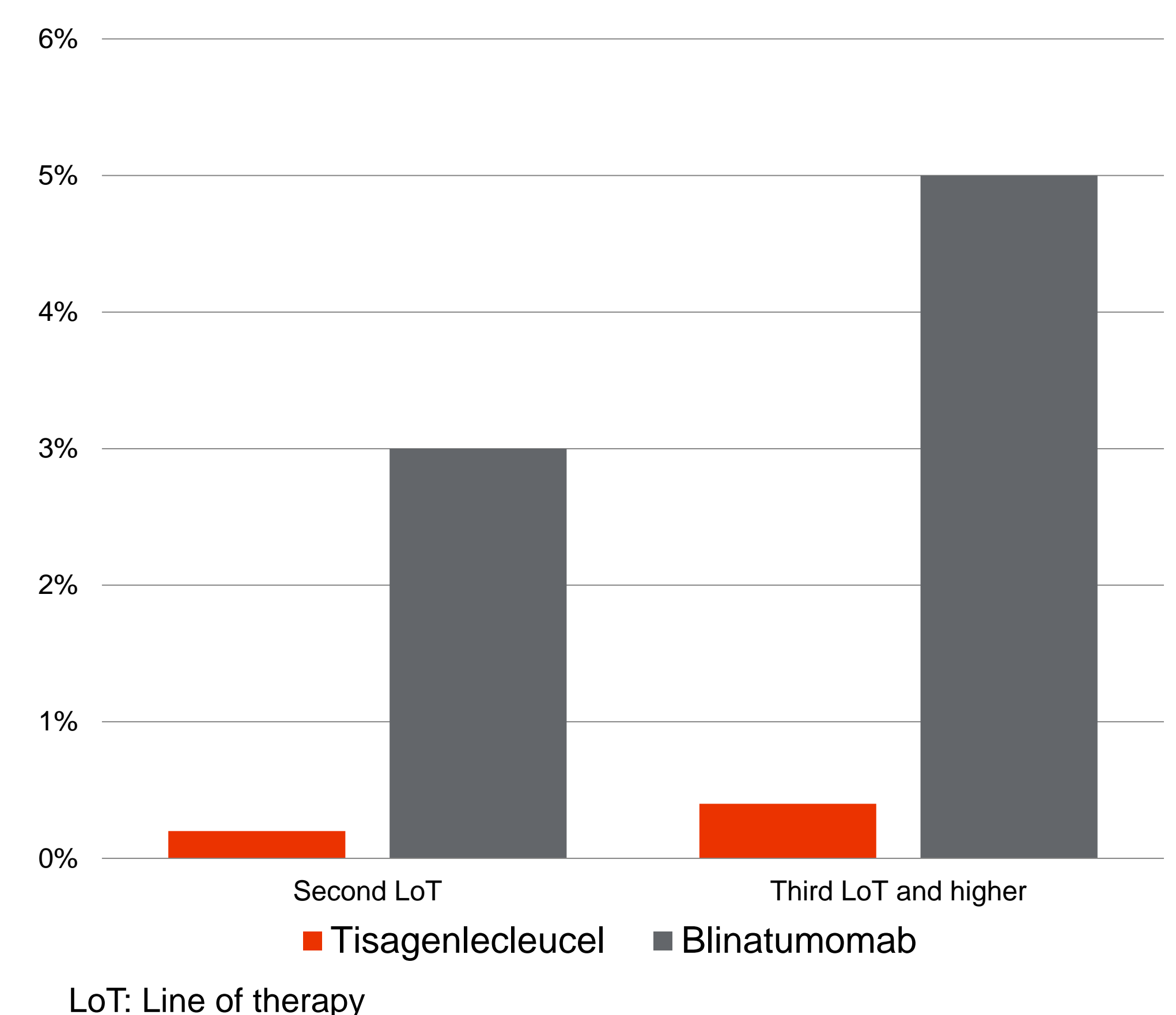


Table 2. Population Characteristics

Parameter	
Length of follow-up, months, mean (SD)	31.6 (20.8)
Length of follow-up, months, median (IQR)	29.0 (38.0)
LoT, mean (SD)	2.2 (1.3)
LoT, median (IQR)	2.0 (2.0)

## CONCLUSIONS

- Real-world claims data from the US show that established chemotherapeutic agents are widely used as initial therapies for ALL patients.
- The use of tisagenlecleucel and blinatumomab for second LoT and higher has been rising over the past five years.
- Limitations:
  - Follow-up time is short for patients diagnosed towards the end of study period.
  - Second LoT (and higher) proportions likely underestimated as data linkage required to incorporate overall survival.

## REFERENCES

- Jabbour, E., Short, N.J., Jain, N. et al. The evolution of acute lymphoblastic leukemia research and therapy at MD Anderson over four decades. *J Hematol Oncol* 16, 22 (2023) <https://doi.org/10.1186/s13095-023-01409-5>
- Komodo Healthcare Map. <https://www.komodohealth.com/>

